

Fun Times at the NIST Center for Neutron Research

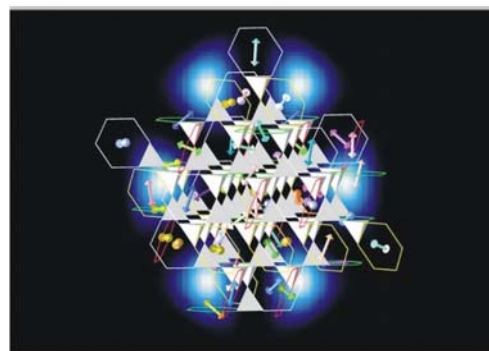
by Prof. Seung-Hun Lee

University of Virginia

Tuesday, October 4, 2005

11:00 a.m., 227/A202

The NIST Center for Neutron Research (NCNR) is an international center for materials research. This talk will present some of the highlights from recent investigations in the field of magnetism performed at NCNR. Magnetic moments in solids usually order. However, when arranged in a triangle-based lattice, the moments cannot order and remain in a spin-liquid state. Utilization of a state-of-the-art spectrometer at NCNR led to the discovery of a hidden order in the complex spin-liquid state.



In geometrically frustrated magnets, such as the corner-sharing tetrahedra (often called a pyrochlore) shown in the figure, the spins can not satisfy all neighboring spin interactions simultaneously, which leads to a highly degenerate magnetic ground state. The hexagon directors, represented by arrows located at the centers of the hexagons, are decoupled from each other. Hence, their reorientations embody the long-sought local zero energy modes for the pyrochlore lattice.

Prof. Lee, Associate Professor in the Department of Physics at the University of Virginia, is a recognized expert on the novel magnetic properties of strongly correlated electron systems. His research focuses on characterizing novel phase transitions, spin dynamics and the interplay between spin, charge and orbital degrees of freedom in geometrically frustrated magnets, magnetic molecules, doped antiferromagnets, heavy fermion systems and superconductors. Prof. Lee was a staff physicist at the NCNR from 2002 – 2005 and received the Young Scientist Award for Excellence in Scientific Research from the NIST Sigma Xi chapter in 2004.